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THE JOURNAL OF PHILOSOPHY

PSYCHOLOGY AND SCIENTIFIC METHODS

THE LOGIC OF JUDGMENTS OF PRACTISE

III. SENSE-PERCEPTION AS KNOWLEDGE

I have mentioned incidentally, in my former article, that it is conceivable that the failure to give adequate consideration to the logical form of practical judgments may have a compromising effect upon the consideration of other forms.¹ I now intend to develop this remark with regard to sense-perception as a form of knowledge. The topic is so bound up with a multitude of perplexing psychological and epistemological traditions that I shall have first to make it reasonably clear what it is and what it is not which I propose to discuss. I endeavored in an earlier series of papers² to point out that the question of the *material* of sense-perception is not, as such, a problem of the theory of knowledge at all, but simply a problem of the occurrence of a certain material—a problem of causal conditions and consequences. That is to say, the problem presented by an optical image³ of a bent stick, or by a dream, or by “secondary” sensory qualities is properly a problem of physics—of the conditions of occurrence, and not of truth or falsity, fact or fiction. That the existence of a red *quale* is dependent upon disturbances of a certain velocity of a medium in connection with certain changes of the organism is not to be confused with the notion that red is a way of knowing, in some more or less adequate fashion, some more “real” object or of knowing itself. The fact of causation—or functional dependence—no more makes the *quale* an “appearance” to the mind of something more real than itself or of itself than it makes bubbles on the water a real fish transferred by some cognitive distortion into a region of appearance. With a little stretching we may use the term “appearance” in either case, but the term only means that the red *quale* or the water-bubbles is an *obvious* or conspicuous thing from which we infer something else not so obvious.

¹ See this JOURNAL, Vol. XII., page 506.

² See this JOURNAL, Vol. VIII., page 393 in an article entitled “Brief Study in Realism.”

³ I use the term image in the sense of optics, not of psychology.

The position which I have freely resumed here was not, however, adequately guarded on all sides. It implies that the question of the existence or presence of the *subject-matter* of even a complex sense perception may be treated as a question of physics. It also implies that the *existence* of sense perception may be treated as a problem of physics. But the position was also taken to imply what I did not mean—that *all* the problems of sense-perception are exhausted in this mode of treatment. There is still, on the contrary, the problem of the cognitive status of sense perception. So far from denying this fact, I meant rather to emphasize it in showing that this knowledge aspect was not to be identified—as it has been in both realistic and idealistic epistemologies—with the simple *occurrence* of presented subject-matter and with the *occurrence* of a perceptive act. It is often stated, for example, that primitive sense objects when they are stripped of all inferential material can not possibly be false—but with the implication that they, therefore, must be true. Well, I meant to go this statement one better—to state that they are neither true nor false—that is, that the distinction of true-or-false is as irrelevant and inapplicable as to any other existence, as it is, say, to being five feet high or having a low blood pressure. That this position when taken leaves over the question of sense perception as knowledge, as capable of truth or falsity, was assumed by me, but undoubtedly the assumption was not made sufficiently clear. It is this question, then, which I intend to discuss in this paper.

I

My first point is that some sense perceptions, at least (as matter of fact the great bulk of them), are without any doubt forms of practical judgments—or, more accurately, are terms in practical judgments as these have been defined—propositions as to what to do. When in walking down the street I see a sign on the lamp-post at the corner, I assuredly see a sign. Now in ordinary context (I do not say always or necessarily) this is a sign of what to do—to continue walking or to turn. The other term of the proposition may not be stated or it may be; it is probably more often tacit. Of course, I have taken the case of the sign purposely. But the case may be extended. The lamp-post as perceived is to a lamp-lighter a sign of something else than a turn, but still a sign of something to be done. To another man, it may be a sign of a possible support. I am anxious not to force the scope of cases of this class beyond what would be accepted by any unbiased person, but I wish to point out that certain features of the perceived object, as a cognitive term, which do not seem at first sight to fall within this class, turn out

upon analysis to do so. It may be said, for example, that our supposed pedestrian perceives much besides that which serves as evidence of the thing to be done. He perceives the lamp-post, for example, and possibly the carbons of the arc. And these assuredly do not enter into the indication of what to do or how to do it.

The reply is threefold. In the first place, it is easy—and usual—to read back into the sense perception more than was actually in it. It is easy to *recall* the familiar features of the lamp-post; it is practically impossible—or at least very unusual—to recall what was actually perceived. So we read the former into the latter. The *tendency* is for the actual perception to limit itself to the minimum which will serve as sign. But, in the second place, since it is never wholly so limited, since there is always a surplusage of perceived object, the fact stated in the objection is admitted. But it is precisely this surplusage which has not *cognitive* status. It does not serve as a sign, but neither is it *known*, or a term in knowledge. A child, walking by his father's side, with no aim and hence no reason for securing indications of what to do, will probably see more in his idle curiosity than his parent. He will have more presented material. But this does not mean that he is making more propositions, but only that he is getting more material for possible propositions. It means, in short, that he is in an esthetic attitude of realization rather than in a cognitive attitude. But even the most economical observer has some esthetic, non-cognitive, surplusage.⁴ In the third place, some surplusage is necessary for the existence of the sign function. Independently of the fact that it may be required to render the sign specific, action is free (its variation is under control) in the degree in which alternatives are present. The pedestrian has probably the two alternatives in mind: to go straight on or to turn. The perceived object might indicate to him another alternative—to stop and inquire of a passer-by. And, as is obvious in a more complicated case, it is the extent of the perceived object which both multiplies alternative ways of acting and gives the ground for selecting among them.⁵ A physician, for example, deliberately avoids such hard and fast alternatives as have been supposed in our instance. He does not observe simply to get an indication of whether the man is well or ill, but, to determine what to do, he extends his explorations over a wide field. Much of his perceived object field is immaterial to what he finally does; that is, it does not serve as sign.

⁴ That something of the cognitive, something of the sign or term function enters in as a catalyzer, so to speak, in even the most esthetic experiences, seems to be altogether probable, but that question it is not necessary to raise here.

⁵ See my article on "Perception and Organic Action," this JOURNAL, Vol. IX., page 645.

But it is all relevant to *judging* what he is to do. We may fairly conclude that sense perception as a term in practical judgment *must* include more than the element which finally serves as sign. If it did not, there would be no perception, but only a direct stimulus to action.⁶

The conclusion that such perceptions as we have been considering are terms in an inference is to be carefully discriminated from the loose statement that sense perceptions are unconscious inferences. There is a great difference between saying that the perception of a shape affords an indication of how to act and saying that the perception of shape is itself an inference. That definite shapes would not be perceived, if it were not for neural changes brought about in prior inferences made on the basis of data which were not as perceived *definite* shapes, is a possibility; it may be, for aught I know, an ascertained fact. Such telescoping of a perceived object with the object inferred from it may be a constant outcome; but in any case the telescoping is not a matter of a present inference going on unconsciously, but is the organic result of a modification occurring in consequence of prior inferences. In similar fashion, to say that to see a table is to get an indication of something to write on is in no way to say that the perception of a table is an inference from sensory data. To say that certain earlier perceived objects not having the character, as perceived, of a table have now "fused" with the results of inferences drawn from them is not to say that the perception of the table is now an inference. Suppose we say that the first perception was of colored patches; that we inferred from this the possibility of reaching and touching, and that on performing these acts we secured certain qualities of hardness, smoothness, etc., and that these are now all fused with the color-patches. At most this only signifies that certain *previously* inferred qualities have now become consolidated with qualities from which they were formerly inferred. And such fusion or consolidation is precisely *not inference*. As matter of fact, such "fusion" of qualities, given and *formerly* inferred, is but a matter of speaking. What has really happened is that brain processes which formerly happened successively now happen simultaneously. What we are dealing with is not a fact of cognition, but a fact of the conditions of occurrence of something.

⁶ The superstition that whatever influences the action of a conscious being must have been an unconscious sensation or perception should be summarily dismissed. We are active beings from the start and are naturally, wholly apart from consciousness, engaged in redirecting our action in response to changes in our surroundings. They are *alternative* possibilities, and hence an indeterminate situation, which change direct response into a response mediated by a perception as a sign of possibilities.

Let us apply the results thus far reached to the question of sense "illusions." The bent reed in the water comes naturally to mind. Purely physical considerations account for the refraction of the light in giving an optical image of a bent stick. This has nothing to do with knowledge or with sense-perception—with seeing. It is simply and wholly a matter of the properties of light and a lens. In the past, however, light refracted and unrefracted, has been a constant stimulus to responsive actions. It is a matter of the native constitution of the organism that light stimulates the eyes to follow and the arms to reach and the hands to clutch and handle. As a consequence, certain arrangements of reflected and refracted light have become a sign of the performance of certain specific acts of handling and touching. As a rule, the stimuli and reactions have occurred in an approximately homogeneous medium—the air. The system of signs or indices of action have been based upon this fact and accommodated to it. A habit or bias in favor of a certain kind of inferred action has been set up. We infer from a bent ray of light that the hand, in touching the reflecting object, will, at a certain point, have to change its direction. This habit is carried over to a medium in which the conclusion does not hold. Instead of saying that light is bent—which it is—we *infer* that the stick is bent: we infer that the hand could not protract a straight course in handling the object. But an expert fisherman never makes such an error in spearing fish. Reacting in media of different refractive capacities, he bases his signs and inferences upon the conditions and results of his media. I see no difference between these cases and that of a man who can read his own tongue. He sees the word "pain" and infers it means a certain physical discomfort. As matter of fact, the thing perceived exists in an unfamiliar medium and signifies bread. To the one accustomed to the French language the right inference occurs.⁷

II

So far as I can see, the pronounced tendency to regard the perceived object as itself the object of a peculiar kind of knowledge instead of as a term in knowledge of the usual kind has two chief causes. One is the confirmed habit of neglecting the wide scope and import of practical judgments. This leads to overlooking the responsive act as the other term indicated by the perception, and to taking the perceived object as the whole of the situation just by itself. The other cause is the fact that just because perceived objects are constantly employed as evidence of what is to be done—or how to do something—they become themselves the objects of pro-

⁷ Compare Woodbridge, this JOURNAL, Vol. X., page 5.

longed and careful scrutiny. We pass naturally and inevitably from recognition to *observation*. The inference will take care of itself if the datum is properly determined. At the present day, a skilled physician will have little difficulty in inferring typhoid instead of malaria from certain symptoms provided he can make certain observations—that is, secure certain data from which to infer. The labor of intelligence is thus transferred from the inference to the determination of data—but the data are determined in the interests of inference and as parts of an inference.

At this point, a significant complication enters in. The ordinary assumption in the discussion of the relation of perceived objects to knowledge is that “the” object—the real object—of knowledge in perception is the thing which *caused* the qualities which are given. It is assumed, that is, that the other term of a proposition in which a given sense datum is one term *must* be the thing which produced it. Since this producing object does not appear for the most part in ordinary sense perception, we have on our hands perception as an epistemological problem—the relation of an appearance to some reality which it, somehow, conceals rather than leads to. Hence also the difficulties of “reconciling” scientific knowledge in physics where these causes *are* the terms of the propositions with “empirical” or sense perception knowledge. Here is where the primary advantage of recognizing that ordinary sense perceptions are forms of practical judgment comes in. In these the other term is open and above board—it is the thing to be done, the response to be selected. To borrow an illustration of Professor Woodbridge’s: A certain sound indicates to the mother that her baby needs attention. If there is error it is not because the sound ought to mean so many vibrations of the air, while as matter of fact it doesn’t even suggest air vibrations, but because there is wrong inference as to the act to be performed.

I imagine that if error never occurred in inferences of this sort the human race would have gone on quite contented with inferences of the practical type. However that may be, errors *do* occur and the endeavor to control inference as to consequences (so as to reduce their likelihood of error) leads to propositions where the “object” of the perceived thing is not something to be done, but the cause which produced it. The mother finds her baby peacefully sleeping and says the baby didn’t *make* the noise. She investigates and decides a swinging door *made* it. Instead of inferring a consequence, she infers a cause. If she had so identified the noise in the first place, she might only have concluded that the hinges needed oiling.

Now where does the argument stand? The proper control of inference in specific cases is found (a) to *lie* in the proper identification of the datum. If the perception is of a certain kind, the

inference takes place as a matter of course; or else it can be suspended until more adequate data are found, and thus error is avoided even if truth be not found. Furthermore (*b*) it is discovered that the most effective way of identifying datum (and securing adequate data) is by inference to its cause. The mother stops short with the baby and the door as causes. But the same motives which made her transfer her inference from consequences to its conditions are the motives which lead others to inferring from sounds to vibrations of air. Hence our scientific propositions about sensory data. They are not, as such, about things to do, but about things which have been done, have happened—"facts." But they have reference, nevertheless, to inferences regarding consequences to be effected. They are the means of securing data which are of a character to prevent errors which would otherwise occur, and to facilitate an entirely new crop of inferences as to possibilities—means and ends—of action. That scientific men should be conscious of this reference or even interested in it is not at all necessary. I am talking about the logic of propositions, not about biography or psychology. If I reverted to psychology, it would be to point out that there is no reason in the world why the practical activity of some men should not be predominantly directed into the pursuits connected with discovery. The extent in which they actually are so directed depends, however, upon social conditions.

III

We are brought to a consideration of the notion of "primitive" sense data. It was for long customary to treat the attempt to define true knowledge in terms of construction from sense data as a confusion of psychology—or the history of the growth of knowledge—with logic, the theory of the character of knowledge as knowledge. As matter of fact, there is confusion, but in the opposite direction. The attempt involved a confusion of logic with psychology—that is, it presented a phase of the technique of the control of inference as if it were natural history of the growth of ideas and beliefs. The chief source of error in ordinary inference is an unperceived complexity of the data. That is, perception which is not itself critically controlled fails to present a sufficiently wide scope of data to secure differentia of possible inferences, and it fails to present, even in what is given, lines of cleavage which are important for proper inference. This is only an elaborate way of saying what scientific inquiry has made clear, that, for purposes of inference as to conditions of production, *ordinary* sense perception is too narrow, too confused, too vivid as to some *quales* and too blurred as to some others. Let us

confine our attention for the moment to its confusion. It has often been pointed out that sense qualities being just what they are, it is illegitimate to introduce such notions as obscurity or confusion into them: a slightly illuminated color is just as irretrievably what it is, as clearly itself, as an object in the broad glare of noon day. But the case stands otherwise when the *quale* is taken as a datum for inference. It is not as easy to identify a perceived object *for purposes of inference* in the dusk as in bright light. From the standpoint of an inference to be effected, the confusion is the same as an undue simplification. This simplification has the effect of making the *quale*, as a term of inference, ambiguous. To infer from it is to subject ourselves to the danger of the fallacies of ambiguity which are expounded in the text-books with reference to ambiguity of verbal symbols. The remedy is clearly the resolution, by experimental means, of what seems to be a simple datum into its "elements," that is, into more ultimate simples. This is a case of analysis; it differs from other modes of analysis only in the subject-matter upon which it is directed, viz., something which had been previously accepted as a simple whole. The result of this analysis is the existence as objects of perception of isolated qualities like the colors of the spectrum as that is scientifically determined, the tones of the scale in all their varying intensities, etc., in short, the "sensations" or sense qualities of contemporary psychology text-books or the "simple ideas" of sensation of Locke. They are not prior to sense-perception, but are the material of sense-perception elaborately discriminated.

Note that these simple data or elements are not original psychologically or historically; they are *logical* primitives—that is, irreducibles for purposes of inference. They are simply the most unambiguous and best defined objects of perception which can be secured to serve as *signs*. They are experimentally determined, with great art, precisely because the naturally given, the historical-psychological, objects in perception have been ambiguous or confused terms in inference. Hence they are replaced, by experimental means involving the use of a wide region of scientific knowledge deductively employed, by simpler sense objects. Stated in current phraseology, "sensations" (*i. e.*, qualities present to sense) are not the elements out of which perceptions are composed, constituted, or constructed; they are the finest, most carefully discriminated objects of perception. We do not first perceive a single, thoroughly defined shade, a tint and hue of red; its perception is the last refinement of observation. Such things are the limits of perception, but they are final, not initial limits. They are what is perceived under the most favorable possible conditions; conditions, moreover, which do not present themselves accidentally, but which have to be intentionally

and experimentally established and whose determination involves the use of a vast body of scientific propositions deductively brought to bear.

I hope it is now evident what was meant by saying that the current empirical logic presents us not with a confusion of psychology with logic, but with a wholesale taking of logical determinations as if they were facts of psychology. The confusion was begun by Locke—or rather made completely current through the enormous influence exercised by Locke—and some reference to Locke may be of aid in clearing up the point. Locke's conception of knowledge was logical, not psychological. He meant by knowledge thoroughly justified beliefs or propositions, "certainty," and carefully distinguished it from what passed current as knowledge at a given time. The latter he called "assent," opinion, belief, or judgment. Moreover, his interest in the latter was wholly logical. He was after an art of controlling the proper degree of assent to be given to matters of probability. In short, his sole aim was to determine certainty where certainty is possible and to determine the due degree of probability in the much vaster range of cases where only probability is attainable. A natural history of the growth of "knowledge" in the sense of what happens to pass for knowledge is the last of his interests. But he was completely under the domination of the ruling idea of his time: namely, that *Nature* is the norm of truth. Now the earliest period of human life presents the "work" of nature in its pure and unadulterated form. The normal is the original, and the original is the normative. Nature is both beneficent and truthful in its work; it retains all the properties of the Supreme Being whose vice-regent it is. To get the logical ultimates we have only, therefore, to get back to the natural primitives. Under the influence of such ideas, Locke writes a mythology of the history of knowledge, starting from clear and distinct meanings, each simple, well-defined, sharply and unambiguously just what it is on its face, without concealments and complications, and proceeds by "natural" compoundings up to the store of complex ideas, and the perception of simple relations of agreement among ideas: a perception always certain if the ideas are simple, and always controllable in the case of the complex ideas if we consider the simple ideas and connections by which they are reached. Thus he established the habit of taking logical discriminations as historical or psychological primitives—as "sources" of beliefs and knowledge instead of as checks upon inference.

I hope reference to Locke will not make him a scapegoat. I should not have mentioned him if it were not that this way of looking at things found its way over into orthodox psychology and then back again into the foundations of logical theory. It may be said

to be the stock in trade of the school of empiricist logicians, and (what is even more important) of the other schools of logic whenever they are dealing with propositions of perception and observation. It led to the supposition that there is a kind of *knowledge* which is directly given in simple apprehension (or sense acquaintance) implying no inference and yet basic to inference. The forcing of problems of epistemology into logic is an inevitable consequence. If what is given in sense is taken as a kind of knowledge, one has to raise the problem of the place and office of the organism in its being given or presented: the mind-body problem henceforth haunts the foundations of logic.⁸ Moreover, since the propositions of physics can not be found among these simple data and these scientific propositions give us the constitution of nature, we have on our hands the problem of the reconciliation of the "world" of sense-perception and the "world" of science. Shall we take the former as an appearance of the latter? If so, how can we argue from appearance—that is, sense perceptions—to reality? How can we transcend the given which is appearance and infer a reality behind, much less make any verifiable judgments about what it is? Relativism or a psychic idealism are fruits. Or at all events the question of the possible validity of scientific propositions becomes a problem.⁹ Moreover, the given in sense varies with the position and structure of the "percipient." Consequently we have the epistemologic problem of the relation of a number of private worlds of knowledge to the one public and impersonal world of science. And so it goes.

IV

I am not trying to discuss or solve these problems. On the contrary, I am trying to show these problems exist only because of the identification of a datum which is determined with reference to inference and for the control of inference, as a knowledge-mode. As against this assumption I point to the following facts. What is actually given as matter of empirical fact may be indefinitely complicated and diffused. As empirically existent it contains already in its givenness functions of inference. Psychologically or historically these are primarily inferences as to what to do in given situations, where the perceived objects supply the signs (indications or evidence), instead of operating, as do unperceived objects, simply as direct stimuli to reactions. The perceived objects never constitute the whole given; they have a context of indefinite empirical extent in which they are set. To control inference it is necessary,

⁸ See, for example, Kemp Smith, this JOURNAL, Vol. IX., page 113.

⁹ Compare Mr. Russell's discussion of "Our Knowledge of the External World."

however, to analyze the situation—to determine what is data for inference and what isn't. This analysis involves discriminative resolution of what seem to be wholes into more ultimate simples. The resources of experimentation, all sorts of microscopic and telescopic and registering apparatus, are called in to perform that analysis. As a result we differentiate not merely visual data from auditory—a discrimination effected by experiments within the reach of everybody—but institute discriminations of vast multitude of visual and auditory data. Physics and physiology and anatomy all play a part in the analysis. We even carry the analysis to the point of regarding say a color as a self-included object un-referred to any other object. We may avoid false inference by conceiving it not as a quality of any object, but as a product of a nervous stimulation and reaction. That is, instead of referring it to a ribbon or piece of paper we may refer it to the organism. But all this is only a part of the technique of suspended inference. We avoid some habitual inference in order in the end to make a more careful inference.

Thus we escape, by a straightening out of our logic (by avoiding erecting a system of logical distinctions and checks into a mythological natural history), the epistemological problems. We also avoid the contradiction which haunts every epistemological scheme so far propounded. As matter of fact every proposition regarding what is "given" to sensation or perception is dependent upon the assumption of a vast amount of scientific knowledge which is the result of a multitude of prior analyses, verifications, and inferences. What a combination of Tantalus and Sisyphus we get when we fancy that we have cleared the slate of all these material implications, fancy that we have really started with simple and independent givens, and then try to show how from these original givens we can arrive at the very knowledge which we have all the time employed in the determination of the simple sense data!

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INTROSPECTION AS A BIOLOGICAL METHOD

IN reading Professor Woodbridge's stimulating article on the Belief in Sensations,¹ I have been impressed by the fact that the conclusion to which he was led, namely, that sensations are not elements of consciousness in any intelligible sense, finds strong support from the neurological side in the difficulty of finding any cortical

¹ Woodbridge, Frederick J. E., "The Belief in Sensations," this JOURNAL, Vol. X., pages 599-608.